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Released

C band 250kW Magnetron

Model No. M1913SV

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Microwave Division

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Microwave Division

Title:

Datasheet of M1913SV

Reference No.:

DS-M1913SV

Rev.:

05E

Sheet:

1/5

■ GENERAL DESCRIPTION

M1913SV is a mechanically tunable frequency pulsed type C-band magnetron designed to operate in the frequency range of 5450MHz to 5750MHz with a peak output power of 250kW.

It is a waveguide output type and is forced air cooled.

A permanent magnet is packaged as part of the magnetron.



■ GENERAL CHARACTERISTICS

ELECTRICAL

PARAMETERS		
Heater voltage	(note 1)	9.5V
Heater current		11A
Minimum pre-heat time		300 sec

MECHANICAL

PARAMETERS		
Overall Dimensions		See outline
Mounting position		Any
Cooling		Forced air.
Output		WR187 waveguide
Output coupling		Mates with UG-148C/U flange.

■ ABSOLUTE MAXIMUM RATINGS

These ratings cannot necessarily be used simultaneously and no individual ratings should be exceeded.

PARAMETERS	Minimum	Maximum	Unit
Heater voltage	-	10.5	V
Heater current	-	13	A
Heater surge current	-	30	A
Cathode preheating time	300	-	sec
Anode voltage (peak)	-	29.0	kV
Anode current (peak)	15	32	A
input power (peak)	-	928	kW
input power (average)	-	928	W
Rate of rise of voltage pulse (note 6)	-	100	kV/ μ s
Duty cycle	-	0.0012	-

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PARAMETERS	Minimum	Maximum	Unit
Pulse duration	0.2	3.5	μs
Pulse recurrence rate	-	2400	pps
Anode temperature	-55	115	°C
Cathode bushing temperature	-55	250	°C
VSWR at load	-	1.5:1	-
Tuner torque	-	0.98	N·m
	-	10	kgf·cm
Pressurizing of output circuit	0.1	0.31	Mpa(abs.)
	1	3.2	kg/cm ² (abs.)

■ ELECTRICAL CHARACTERISTICS

Test conditions	Oscillation	Units
Heater voltage (preheating)	9.5	V
Heater voltage (for test)	7.5	V
Anode current (average)	24	mA
Duty cycle	0.001	-
Pulse duration	1.7 to 2.3	μs
VSWR at the output coupler	1.1:1	-
Rate of rise of voltage pulse (note 6)	90 max	kV/μs
Pressurizing of output circuit	0.15~0.2	MPa
	1.5~2	kg/cm ²

Limits	Minimum	Maximum	Units
Anode voltage (peak) (Frequency=5625MHz)	26.8	28.3	kV
Output power (average) (note 3)	250	-	W
Tunable Frequency			
Upper Limit	5750	-	MHz
Lower Limit	-	5450	MHz
R.F. bandwidth at 1/4 power (note 3,5)	-	2.5/t _p	MHz
Minor lobes (note 3,5)	8	-	dB
Stability (note 2,3,4)	-	0.5	%
Heater current Ef=9.5V, tk=180sec min	10	12	A
Spurious output ratio (note 3,7)	-45	-	dBc
Impedance (note 8)	1100	1200	Ω

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■ LIFE TEST

Life Test conditions

Under the test conditions specified above.

The magnetron is deemed to have reached end of life when it fails to satisfy the following:

PARAMETERS	Minimum	Maximum	Units
Output power (average) (note3)	200	-	W
R.F. bandwidth at 1/4 power (note3,5)	-	3.0/tpc	MHz
Stability (notes 2,3,4)	-	1.0	%

Notes

1. With no anode input power.

During high voltage operation it is essential to operate the heater according to the following schedule:

$$\text{Heater voltage(for test)} = 9.5(1 - P_i/2850) \text{ volts}$$

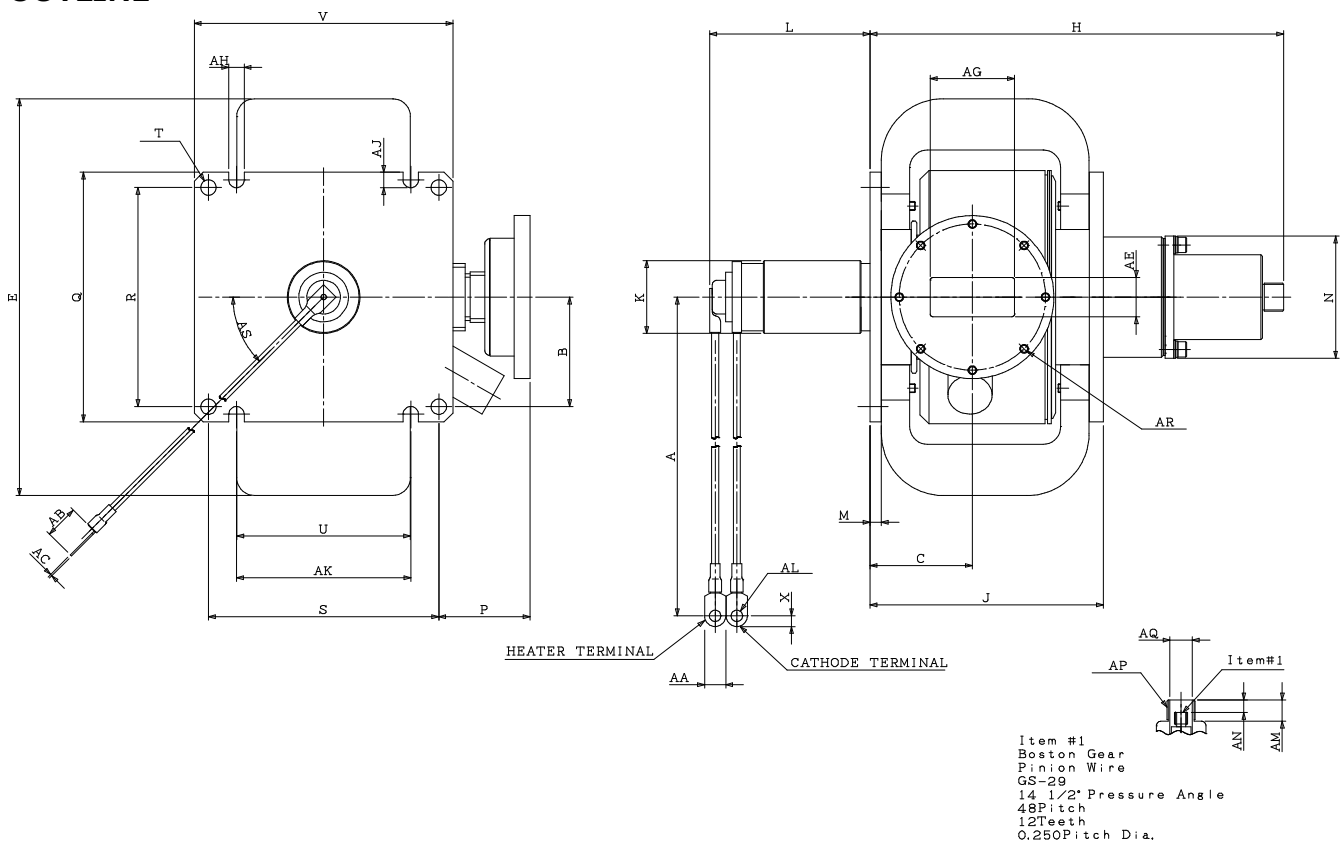
Where P_i = average input power in watts.

The magnetron heater shall be protected against arcing by use of a minimum capacitance of 4000pF shunted across the heater directly at the terminals.

2. Pulses are defined as missing when the r.f. energy level is less than 70% of the normal energy level in the rated frequency range of the magnetron. Missing pulses are expressed as a percentage of the number of input pulses applied during the last 3 minutes of a test interval not to exceed 6 minutes.
3. These tests are carried out at
 - F1=5450±20MHz,
 - F2=5600±20MHz,
 - F3=5750±20MHz.
4. With the magnetron operating into a V.S.W.R. of 1.3:1 phased to give maximum instability.
5. With the magnetron operating into a V.S.W.R. of 1.3:1 phased to give maximum spectrum degradation.
6. The rate of rise of voltage is the slope of the steepest tangent to the leading edge of the voltage pulse above 70% amplitude. Any capacitance used in the viewing system must not exceed 6.0pF.
7. Spurious output ratio shall be measured in accordance with MIL-STD-1311C, method 4243A. Spurious output signals are measured within 5GHz to 6GHz.
8. These tests are carried out at
 - Frequency=5600±20MHz
 - Output power (peak)=280kW

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■ OUTLINE



Outline Dimensions (All dimensions without limits are nominal)

Ref.	Min.	Max.	Ref.	Min.	Max.	Ref.	Min.	Max.
A	210.0	230.0	R	123.55	124.05	AJ	8.4	
B	58.72	65.07	S	129.75	130.25	AK	98.15	98.65
C	57.0	58.4	T	φ8.5	φ8.9	AL	φ6.4	
E	—	226.21	U	—	98.0	AM	12	
H	—	235.45	V	—	147.3	AN	7	
J	—	131.57	X	6		AP	5/8-24-NEF-2	
K	—	φ41.66	AA	12		AQ	φ12.3	φ12.9
L	—	92.08	AB	19		AU	No10-32-Nf-2	
M	6.35		AC	1		AS	45°	
N	—	φ74.7	AE	22.15				
P	49.92	53.12	AG	47.55				
Q	—	141	AH	8.4				

(Dimensions in millimeters)

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